Roll No												

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF INFORMATION SCIENCE

MAKEUP EXAMINATION – JAN 2023

Course Code: BCA 2002

Course Name: Data Structures and Algorithms

Program :BCA/BCG/BCV/BSD

Date: 23-JAN-2023

Time: 01:00 PM – 04:00 PM

Max Marks: 100

Weightage: 50%

Instructions:

(i) Read the all questions carefully and answer accordingly.

(ii) All the questions are mandatory.

Part A [Memory Recall Questions]

Answer all the Questions. Each question carries Five marks. (4Qx 5M= 20M)

1. Give a general syntax for a Structure with example. (C.O.No.1) [Knowledge]
2. Define Data Structures. Explain the types of data structures. (C.O.No.1) [Knowledge]
3. Define a pointer along with syntax of declaring and defining a pointer. (C.O.No.1) [Knowledge]
4. What is a Queue? Explain the operations of Queue. (C.O.No.1) [Knowledge]

Part B [Thought Provoking Questions]

Answer all the Questions. Each question carries Ten marks. (5Qx10M=50M)

5. Mr. XYZ working as a office assistant in an organization. He will receive the files which he has to verify. Every day the files are kept on his table in a rack such that the first kept file will be accessed first. Help Mr. XYZ to demonstrate the functionalities such as
   a. ordering of keeping the files,
   b. Display the order in which the files are kept on the table.
   c. Verify the file and remove from the table which is at the front.

   (C.O.No.1) [Comprehension]
6. A train in a railway station has 5 bogies which are connected to each other. Write a c code to add one more bogie(bno) from the last using linked list representation using following signature. Location insertlast(Location first, int bno). (C.O.No.1) [Comprehension]

7. Construct the Binary search Tree with the following elements. 13, 3, 4, 12, 14, 10, 5, 1, 8, 2, 7, 9, 11, 6, 18. Traverse this tree in pre-order, post-order, and In-order traversal.

(C.O.No.3) [Comprehension]

8. There are six houses namely A, B, C, D, E, F and G are there in a layout, which are aligned in the following order. A is a neighbor of B and D, B is a neighbor of A, E and C, C is neighbor of B, E F and G, D is neighbor of A and E, E is neighbor of A, B, C, D and F, F is neighbor of E, C and G, G is neighbor C and F. Construct the graph accordingly. Traverse the graph starting from E using Depth First Search algorithm. (C.O.No.4) [Comprehension]
9. Write a BFS program for the above-mentioned graph (Refer Q.NO.8).

(C.O.No.4) [Comprehension]

Part C [Problem Solving Questions]

Answer all the Questions. Each question carries FIFTEEN marks. (2Qx15M=30M)

10. Given the Music player record which contains the details Song_Number, Song_Name and Film_Name. Write a code segment to insert a song in last using Singly Linked List and also to delete a song from the front using song name. (C.O.No.3) [Application]

11. Mr. XYZ has a problem in storing and deleting records based on employee ID. So, the functions should include Inserting, Deleting, and displaying of the employee Ids. Develop program for the same if he has stored the data as and when arrived in LIFO manner.

(C.O.No.1) [Application]